

CLAIMS

What is claimed is:

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1. A modified plant zinc finger protein (ZFP) that binds to a target sequence.
2. The modified plant zinc finger protein of claim 1, wherein the target sequence is a nucleic acid sequence.
3. The modified plant zinc finger protein of claim 2, wherein the nucleic acid is DNA.
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4. The modified plant zinc finger protein of claim 2, wherein the target sequence is 3 or more contiguous nucleotides.
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5. The modified plant zinc finger protein of claim 1 comprising a tandem array of zinc fingers.
6. The modified plant zinc finger protein of claim 5, wherein one or more of the zinc fingers of the ZFP are obtained by rational design.
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7. The modified plant zinc finger protein of claim 5, wherein one or more of the zinc fingers of the ZFP are obtained by selection.
8. The modified plant zinc finger protein of claim 7, wherein selection is phage display, interaction trap, ribosome display and RNA-peptide fusion.
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9. The modified plant zinc finger protein of claim 5, wherein one or more of the zinc fingers comprise canonical C₂H₂ zinc fingers.
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10. The modified plant zinc finger protein of claim 5, wherein one or more of the zinc fingers comprise non-canonical zinc fingers.

11. The modified plant zinc finger protein of claim 5, wherein one or more of the zinc fingers are derived from two or more plant species.

12. The modified plant zinc finger protein of claim 5, wherein one or more amino acid
5 residues are deleted or substituted as compared to a naturally occurring plant ZFP.

13. The modified plant zinc finger protein of claim 12, wherein one or more amino acid residues are deleted between one or more of the zinc fingers.

10 14. A fusion polypeptide comprising (i) a modified plant ZFP as described herein and (ii) at least one functional domain.

15 15. The fusion polypeptide of claim 14, wherein the functional domain is a repressive domain.

16. The fusion polypeptide of claim 14, wherein the functional domain is a activation domain.

20 17. An isolated polynucleotide encoding the modified plant zinc finger protein of claim 1.

18. An expression vector comprising the isolated polynucleotide of claim 17.

19. A host cell comprising the isolated polynucleotide of claim 17.

25 20. A method for modulating gene expression in a plant cell; the method comprising contacting the cell with a modified plant zinc finger protein (ZFP) comprising a tandem array of zinc fingers.